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# HIV testing among heterosexuals at elevated risk for HIV in the District of Columbia: has anything changed over time?

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## Abstract

The District of Columbia launched a routine HIV testing initiative in 2006. We examined HIV testing behaviors among heterosexuals at risk for HIV over time using CDC National HIV Behavioral Surveillance data from Washington, DC for the heterosexual cycles from 2006-7 ("Cycle 1") and 2010 ("Cycle 2"). Past year and past two-year HIV testing across study cycles were compared using chi-square tests. Weighted multivariable logistic regression identified correlates of past year testing. The majority of participants across both cycles were black and female. Cycle 1 participants were significantly more likely to have ≥4 partners in the past year, casual sex partners, and have anal sex at last sexual encounter ($p<0.05$). Lifetime testing was high, and individuals from Cycle 2 versus Cycle 1 were more likely to have been tested in the past two years. There were no significant differences in past year testing or being offered the HIV test at last health care visit by cycle. Independent correlates of past year testing were seeing a health care provider in the past year and using condoms at last vaginal sex. In conclusion, although past year testing did not differ between the two data collection years, the proportion of heterosexuals testing in the past two years was higher in Cycle 2 versus Cycle 1, suggesting successful expansion of HIV testing between the two time periods.

### Keywords

HIV testing; high-risk heterosexuals; routine HIV testing

## Introduction

Washington, DC has one of the highest HIV/AIDS case rates in the United States, with an estimated 2.7% of DC residents living with HIV (1). Heterosexual transmission accounted for nearly one-third of all newly diagnosed HIV cases in the District between 2006-10

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(31.7%) (1), consistent with national level trends, in which heterosexual transmission accounted for 33% of new HIV cases reported in 2010 (2).

According to recent estimates, 21% of HIV infected individuals in the United States are unaware of their status (3). HIV testing is a major component of the National HIV/AIDS Strategy (NHAS) for the United States (4), yet according to recent National Health Information Survey data, only 45% of the general U.S. population has reported ever being tested for HIV (5). With the recent focus on the test and treat model, which supports the early identification of HIV-positive individuals and their immediate linkage to HIV care (6), and the launch of the NHAS (4), much importance has been placed on expanding HIV testing to identify new cases, particularly in high prevalence settings. Routine HIV testing has also been shown to be cost-effective (7).

In September 2006, the Centers for Disease Control and Prevention (CDC) released revised HIV testing guidelines recommending routine, opt-out HIV testing among all individuals between 13 and 64 years of age in jurisdictions with a HIV prevalence greater than 1% (8). In advance of these guidelines, the District of Columbia (DC), recognizing the severe impact the HIV epidemic has had on residents, launched a city-wide routine HIV testing initiative in June 2006 called "***Come Together DC—Get Screened for HIV***" (9, 10), in which the DC Department of Health coordinated an expansion of HIV testing through collaborations with community-based organizations, local emergency departments, and hospitals (10-12). Despite initial evaluations on the implementation of the routine HIV testing campaign (9, 10), little research has been done to assess the potential ongoing, community-wide impact on HIV testing behaviors from the routine testing campaign in DC.

Using data from the CDC-funded National HIV Behavioral Surveillance (NHBS) system conducted in Washington, DC, this study sought to examine changes in HIV testing behaviors and assess correlates of past year testing among heterosexuals at elevated risk for HIV who participated in the 2006-7 and 2010 heterosexual NHBS cycles in the District of Columbia.

## Methods

### Study population and recruitment

NHBS has been conducted in Washington, DC by the District of Columbia Department of Health in partnership with the George Washington University School of Public Health and Health Services (GWU) since 2006. NHBS is comprised of serial, cross-sectional surveys of community-recruited individuals from the three highest risk groups for HIV acquisition: men who have sex with men (MSM), injection drug users (IDU), and heterosexuals at elevated risk for HIV (HET), which has been described extensively elsewhere (13-16). Data from the first NHBS data collection year (December 2006 to October 2007, or "Cycle 1") and second data collection year (August to December 2010, or "Cycle 2") for heterosexuals at elevated risk for HIV for Washington, DC were used for this analysis. Because the study design is cross-sectional and not longitudinal, separate groups of individuals were recruited during each data collection year.

Both study samples were recruited using respondent-driven sampling (RDS), which has been described elsewhere and has been used with heterosexual networks (13, 17-19). RDS is a chain-referral method that accesses hard-to-reach populations which can allow for generalizability to the population of networks from which the sample was drawn, given that certain assumptions are met [e.g., participants know one another as members of the population and come from dense networks to sustain long chains and recruitment waves form without too much insularity (homophily)] (13, 17-19). These assumptions were checked throughout the data collection process and at the end of the data collection periods to ensure that the assumptions were met. Individuals who were purposively-selected to start recruitment chains (also called "seeds") completed a behavioral survey and a HIV test. All study interviews and procedures were conducted at the community-based GWU research clinic in Southeast DC in a professional office building. Seed and individuals who were eligible to recruit others for the study were asked to refer members of their social and sexual networks into the study. Individuals referred to the study who met the eligibility criteria also completed the survey, were offered an HIV test and were also assessed for eligibility to recruit members of their network. All study participants were compensated for completing the survey and taking the HIV test, and eligible recruiters were also compensated for each referral who was eligible and completed the study.

For the purposes of the NHBS study, the definition of "heterosexual" is self-reporting having had sex with a member of the opposite sex in the past 12 months, rather than being defined by self-reported sexual preference. For Cycle 1, eligibility included being male or female; aged 18-50; having had sex with a member of the opposite sex in the past year; and living in the DC metropolitan statistical area. For Cycle 2, the same inclusion criteria were used, except individuals aged 18-60 were eligible. There were also minor differences in the recruitment eligibility between the two study years. For the Cycle 1 sample, eligible recruiters had to live in protocol-designated high-risk areas, as determined by a complex algorithm that combined poverty (based on census data) and AIDS case rates (based on the AIDS case estimates available at the time of study conduct; HIV case data were not available at the time) (13). In 2010, participants who had a household income less than the U.S. Health and Human Services poverty guidelines and/or had a high school diploma or less were eligible to recruit. For this analysis, individuals who reported any injection drug use in the past year were excluded. In addition, the sample size goal (as determined by the CDC) was larger for Cycle 1 than Cycle 2 since Cycle 1 occurred over a period of two years (2006-7) versus one year for Cycle 2 (2010 only).

## Data collection

All data collection and study participation was anonymous. HIV screening was conducted using a rapid oral test (OraQuick Advance 1/2, OraSure Technologies, Bethlehem, PA). Confirmation of serostatus was conducted by Western Blot by whole blood for Cycle 1 and by oral specimen collected via OraSure test kit for Cycle 2.

Participants completed a computerized, interviewer-assisted, structured behavioral survey including questions on demographics, sexual/drug use behaviors, HIV testing behaviors (past year and past two years), and other potential correlates of HIV infection and testing,

such as seeing a medical provider in the past 12 months. The survey was developed, pre-tested and pilot-tested extensively by the NHBS team at the CDC with input from staff from field sites. Although the same tool was used for both men and women, the computerized interviewed was programmed so that questions not relevant for a particular gender were not asked.

### Data analysis

**Univariate and bivariate analyses—**To assess the effect of the launch of the 2006 city-wide HIV testing program, the proportion of individuals testing in the past 12 months and past 24 months across Cycle 1 and Cycle 2 data collection years were compared. The proportion of those being offered a HIV test by a health care provider among those who sought care in the past 12 and 24 months were also compared across cycles, as well as HIV seroprevalence, testing behaviors and characteristics of the test itself. Demographic characteristics were analyzed for Cycle 1 and Cycle 2 separately due to differences in the recruitment criteria.

Because participants were recruited using RDS, all estimates were weighted using the RDS Analytical Tool (RDSAT v5.6.0) with enhanced data smoothing and 15,000 bootstraps. Since current IDUs were part of the recruitment chain in Cycle 1, trivalent weights were calculated (IDU-status by HIV testing by covariate). Individualized weights were exported from RDSAT v5.6.0 into SAS v9.2 (Cary, NC) for analysis. All weighted estimates were compared between the two data collection years using a chi-square test of proportions.

**Multivariate analyses—**Because CDC testing guidelines recommend HIV screening among high risk populations on an annual basis (8), HIV testing in the past 12 months was used as the primary outcome for the multivariable analyses to examine the independent effect of data collection year and other demographic and behavioral correlates of HIV testing. With the exception of data collection year, which was retained in the model to assess its association with past year HIV testing and to adjust for overall differences in the two samples, backwards, manual step-wise elimination was used to build the multivariable model. Variables with a p-value $\leq 0.05$ were retained in the final model. Although there is no consensus on weighting when building multivariable models using RDS data, following previous work using multivariable regression modeling with RDS-collected data (20, 21), data in the multivariable model were weighted based on the outcome (HIV testing) using weights unique to the data collection years.

## Results

In Cycle 1, 750 heterosexuals at elevated risk for HIV were recruited; in Cycle 2, 482 were recruited. Demographic and sexual behavior characteristics are presented in Table 1. The majority of study participants were black and more than half were female. There were no differences in age, education, employment status, income, and health insurance status between the two groups. A higher proportion of participants from Cycle 1 self-identified as being heterosexual than from Cycle 2 (90% versus 81%, respectively; chi-square: 7.16, $p=0.03$), higher proportions of former and current homelessness were observed in the Cycle 2 sample versus in the Cycle 1 sample (chi-square: 28.7, $p<0.0001$) as well as being arrested

in the past 12 months (chi-square: 4.48, p=0.03). In addition, a larger proportion of participants in the Cycle 2 sample had four or more partners and engaged in anal sex, and a smaller proportion engaged in vaginal sex compared to participants recruited in Cycle 1. Condom use at last vaginal and anal sex did not differ across the two groups.

HIV seroprevalence was elevated compared to the estimated general prevalence in Washington, DC across both groups (Table 2), but did not differ statistically across study cycles (5.2% and 8.0% in Cycles 1 and 2, respectively; chi-square: 1.17, p=0.28). In addition, although the overall HIV prevalence in Cycle 2 was higher, the proportion of newly identified positives was lower in Cycle 2 versus Cycle 1 (21% versus 48%; chi-square: 1.74, p=0.19), although this was also not statistically significantly different. The majority had ever tested for HIV (88% and 85% in Cycles 1 and 2, respectively; chi-square: 0.02, p=0.88); among those, individuals enrolled in Cycle 2 versus Cycle 1 were significantly more likely to have been tested in the past two years (83% vs. 76%; chi-square: 4.81, p=0.03). There was no significant difference in the proportion of participants who reported testing in the past year. Participants from Cycle 2 were more likely to report being tested with an oral swab than those recruited during Cycle 1 (61% versus 41%, respectively; chi-square: 24.5, p<0.0001). There were no differences in being offered the HIV test at last health care visit between data collection years.

In the multivariable analyses identifying correlates of past year testing (Table 3), having seen a health care provider in the past 12 months (adjusted odds ratio [aOR]: 3.7, 95% confidence interval [CI]: 2.3, 5.9) and using condoms at last vaginal sex (aOR: 1.7, 95% CI: 1.1, 2.5) were independently associated with testing for HIV in the past year after adjusting for study cycle. Study cycle was not significantly associated with testing for HIV in the past 12 months.

## Discussion

In this study of heterosexuals at elevated risk for HIV in Washington, DC, the proportion of individuals who reported HIV testing in the past two years was higher in Cycle 2 versus Cycle 1, yet no differences existed in the proportion of individuals who tested in the past year. However, having seen a medical provider in the past 12 months was independently associated with having been tested in the past year. This may be explained by the onset of the DC HIV testing campaign, which focused part of its campaign on implementing routine testing at all medical encounters for all citizens between the ages of 13-84 years (9). Other jurisdictions have launched city-wide routine testing programs, such as the Bronx, New York (22) and the Washington, DC Veterans Administration system (23) and have observed increased prevalence of both lifetime and past-year testing based on post-campaign evaluations.

It is important to note that lifetime HIV testing in Washington, DC has been observed to be consistently high, ranging from 75% according to data from the Behavioral Risk Factors Surveillance System (BRFSS) in 2008 (24) to 68% among those who tested as part of the DC routine HIV testing campaign (9) to 85-88% in these data. The proportions we observed in the NHBS samples were higher, which may be due to specific sampling from a high-risk

heterosexual population versus the U.S. general population as in the BRFSS or the DC general population.

For the DC testing campaign, major efforts were focused on expanding capacity for testing at community-based organizations and medical facilities, greater access to rapid HIV test kits at no cost, and direct marketing about the importance of HIV screening to DC residents (9, 10, 25), with the ultimate goal of "laying the foundation for an expanding HIV testing program by 2008" (25). Specific efforts to expand HIV testing in medical facilities included testing in emergency rooms (12), in-patient hospital settings (11), and primary care physician offices (9). Approximately two-thirds of individuals tested as part of the DC HIV screening campaign in 2006 reported having ever been tested before, and of those, less than half had been tested in the past 12 months (9), which is lower than the proportions we observed in the NHBS-recruited samples (56%-61%). Regardless, the proportion of individuals testing in the past year did not differ between the two groups, confirming that the recommendation for annual testing has not yet been fully adopted across the city, particularly among this population at risk. However, self-reported testing within the past two years was significantly higher in the Cycle 2 sample, suggesting that, while individuals are not testing as frequently as recommended by the CDC, the expanded testing campaign has been effective in increasing the proportion of recent testers compared to individuals who were recruited during the time the campaign was commencing. The significant change in the proportion of individuals testing using an oral rapid test, which was the kind of test that was distributed by the DC DOH at no cost to community-based organizations and medical facilities for the HIV testing initiative, suggests that the expansion of testing as observed in the increase of past two year testing was likely a result of the DOH HIV testing initiative. In addition, although not statistically significant, a lower proportion of newly positive individuals was identified in Cycle 2 compared to Cycle 1, also suggesting that despite reporting a higher prevalence of risk behaviors, the Cycle 2 sample may be more likely to know their status as a result of the expanded testing program that occurred in previous years. This is consistent with DC HIV surveillance data which demonstrated an increase in new HIV diagnoses between 2005 and 2007, yet decreased number of new diagnoses after that (1).

Although the proportion of individuals testing in the past year did not differ across the two time points, we observed an independent association between seeing a healthcare provider in the past year and being tested in the past year, regardless of study year. This suggests and underscores that healthcare providers are an important component of expanding HIV testing among high risk heterosexual populations. The proportion of individuals who were offered HIV testing at their last visit with a health care provider was slightly higher in Cycle 2 but was not statistically significantly different from the Cycle 1 time period. Despite a major initiative to educate and promote routine HIV testing among medical professionals in DC which was launched in 2007 (25), only half of participants were offered HIV testing through their medical provider, a proportion that should be increased in order to maximize the impact of HIV testing expansion in Washington, DC. Because it is believed that one-fifth of HIV-positive individuals are undiagnosed, the offer of routine testing at all medical encounters is critical for a city like Washington, DC with a high HIV prevalence.

There are both limitations and strengths to this analysis. First, although HIV serostatus is measured by serologic testing, the behavioral and testing data collected for NHBS are by self-report; therefore, the exact dates of testing may not be fully valid and are subject to recall. However, study interviewers were highly trained to objectively probe study participants for the most accurate date possible. Second, the timing of launch of the DC testing initiative overlapped with data collection for Cycle 1; therefore, the high proportion of lifetime and past year testing in Cycle 1 may reflect the beginning of the expanded HIV testing initiative. To estimate the potential effect the emerging testing campaign may have had on HIV testing in Cycle 1, HET-1 study participants were asked whether they had heard about the DC HIV screening campaign; only 31% had heard of the program (unpublished data). Lastly, the eligibility and recruitment criteria differed slightly between the two data collection years; therefore, the data presented are suggestive of trends and direct comparisons should not be made. Regardless, these data give researchers and public health pracitioners a snapshot of current testing behaviors beyond clinic and CBO settings. A major strength of this analysis is the use of community-based samples of heterosexuals at elevated risk for HIV that were assembled using rigorous, CDC-developed protocols. The use of RDS allows for a sample that may be generalizable to the networks from which these samples were drawn. Because there is no known sampling frame for heterosexuals at elevated risk for HIV, RDS is thought to be superior to convenience and snowball sampling (17, 19, 26). An additional strength is the ability to compare testing behaviors between these two time points, during which the expanded HIV testing initiative was launched. Although the eligibility and recruitment criteria were slightly different, the majority of the samples were recruited from the same neighborhoods and census tracts (data not shown).

In conclusion, past year HIV testing rates in Washington, DC among heterosexuals at elevated risk for HIV were relatively similar between Cycle 1 and Cycle 2, yet the proportion testing in the past two years was higher in Cycle 2, likely due to the District's city-wide expanded testing program introduced during Cycle 1. Due to the high HIV prevalence in DC, annual routine testing, as recommended by the CDC, should be further reinforced above and beyond the HIV testing campaigns. One of the reasons for the lack of change in past year testing could signal a "plateauing" of the reach of the HIV testing initiative, suggesting that additional methods of reaching populations at risk for HIV, including heterosexuals, should be explored to increase HIV test-seeking behaviors. Continued surveillance of adherence to HIV testing recommendations and identification of individual level and structural barriers to annual testing among both consumers and health care providers is critical in order to increase knowledge of one's status and to reduce the proportion of undiagnosed HIV cases in the city and interrupt transmission. Although past year testing was associated with seeing a health care provider, simultaneous efforts should be made to increase coverage of routine HIV testing at all health care visits, particularly with this at-risk group. Given that HIV testing is one of the cornerstones of HIV prevention, interventions to increase testing among those at risk for HIV are critical in meeting national HIV/AIDS strategy goals.

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## References

1. District of Columbia Department of Health HIV/AIDS Hepatitis STDs and Tuberculosis Administration. District of Columbia Department of Health HIV/AIDS, Hepatitis, STD and TB Epidemiology Annual Report 2011. Washington, DC: District of Columbia Department of Health; 2012.
2. Centers for Disease Control and Prevention. HIV Surveillance Report: Diagnoses of HIV Infection and AIDS in the Unites States and Dependent Areas, 2010. Atlanta, GA: Centers for Disease Control and Prevention; 2010.
3. Campsmith ML, Rhodes PH, Hall HI, Green TA. Undiagnosed HIV prevalence among adults and adolescents in the United States at the end of 2006. J Acquir Immune Defic Syndr. 2010; 53(5):619–24. [PubMed: 19838124]
4. Office of National AIDS Policy. National HIV/AIDS Strategy. Washington, DC: Office of National AIDS Policy; 2010.
5. Centers for Disease Control and Prevention. Vital signs: HIV testing and diagnosis among adults--United States, 2001-2009. MMWR Morb Mortal Wkly Rep. 2010; 59(47):1550–5. [PubMed: 21124295]
6. Granich RM, Gilks CF, Dye C, De Cock KM, Williams BG. Universal voluntary HIV testing with immediate antiretroviral therapy as a strategy for elimination of HIV transmission: a mathematical model. Lancet. 2009; 373(9657):48–57. [PubMed: 19038438]
7. Walensky RP, Freedberg KA, Weinstein MC, Paltiel AD. Cost-effectiveness of HIV testing and treatment in the United States. Clin Infect Dis. 2007; 45(Suppl 4):S248–54. [PubMed: 18190295]
8. Branson BM, Handsfield HH, Lampe MA, Janssen RS, Taylor AW, Lyss SB, et al. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. MMWR Recomm Rep. 2006; 55(RR-14):1–17. quiz CE1-4. [PubMed: 16988643]
9. Castel AD, Magnus M, Peterson J, Anand K, Wu C, Martin M, et al. Implementing a novel citywide rapid HIV testing campaign in Washington, D.C.: findings and lessons learned. Public Health Rep. 2012; 127(4):422–31. [PubMed: 22753985]
10. Centers for Disease Control and Prevention. Expanded HIV testing and trends in diagnoses of HIV infection - District of Columbia, 2004-2008. MMWR Morb Mortal Wkly Rep. 2010; 59(24):737–41. [PubMed: 20577154]
11. Maxwell CJ, Sitapati AM, Abdus-Salaam SS, Scott V, Martin M, Holt-Brockenbrough ME, et al. A model for routine hospital-wide HIV screening: lessons learned and public health implications. J Natl Med Assoc. 2010; 102(12):1165–72. [PubMed: 21287897]
12. Brown J, Shesser R, Simon G, Bahn M, Czarnogorski M, Kuo I, et al. Routine HIV screening in the emergency department using the new US Centers for Disease Control and Prevention Guidelines: results from a high-prevalence area. J Acquir Immune Defic Syndr. 2007; 46(4):395–401. [PubMed: 18077831]
13. Magnus M, Kuo I, Shelley K, Rawls A, Peterson J, Montanez L, et al. Risk factors driving the emergence of a generalized heterosexual HIV epidemic in Washington, District of Columbia networks at risk. AIDS. 2009; 23(10):1277–84. [PubMed: 19440142]
14. Dinenno EA, Oster AM, Sionean C, Denning P, Lansky A. Piloting a System for Behavioral Surveillance Among Heterosexuals at Increased Risk of HIV in the United States. Open AIDS J. 2012; 6:169–76. [PubMed: 23049666]

15. Lansky A, Drake A, DiNenno E, Lee CW. HIV behavioral surveillance among the U.S. general population. Public Health Rep. 2007; 122(Suppl 1):24–31. [PubMed: 17354524]
16. Centers for Disease Control and Prevention. Characteristics associated with HIV infection among heterosexuals in urban areas with high AIDS prevalence --- 24 cities, United States, 2006-2007. MMWR Morb Mortal Wkly Rep. 2011; 60(31):1045–9. [PubMed: 21832975]
17. Heckathorn DD. Respondent-Driven Sampling: A New Approach to the Study of Hidden Populations. Social Problems. 1997; 44(2):174–99.
18. Salganik M, Heckathorn DD. Sampling and estimation in hidden populations using respondent-driven sampling. Sociological Methodology. 2004; 34:193–239.
19. Heckathorn DD. Respondent-Driven Sampling II: Deriving Valid Population Estimates from Chain-Referral Samples of Hidden Populations. Social Problems. 2002; 49(1):11–34.
20. Johnston L, O'Bra H, Chopra M, Mathews C, Townsend L, Sabin K, et al. The associations of voluntary counseling and testing acceptance and the perceived likelihood of being HIV-infected among men with multiple sex partners in a South African township. AIDS Behav. 2010; 14(4): 922–31. [PubMed: 18270809]
21. Risser JM, Padgett P, Wolverton M, Risser WL. Relationship between heterosexual anal sex, injection drug use and HIV infection among black men and women. Int J STD AIDS. 2009; 20(5): 310–4. [PubMed: 19386966]
22. Myers JE, Braunstein SL, Shepard CW, Cutler BH, Mantsios AR, Sweeney MM, et al. Assessing the impact of a community-wide HIV testing scale-up initiative in a major urban epidemic. J Acquir Immune Defic Syndr. 2012; 61(1):23–31. [PubMed: 22739134]
23. Nayak SU, Welch ML, Kan VL. Greater HIV testing after Veterans Health Administration policy change: the experience from a VA Medical Center in a high HIV prevalence area. J Acquir Immune Defic Syndr. 2012; 60(2):165–8. [PubMed: 22627183]
24. Du P, Camacho F, Zurlo J, Lengerich EJ. Human immunodeficiency virus testing behaviors among US adults: the roles of individual factors, legislative status, and public health resources. Sex Transm Dis. 2011; 38(9):858–64. [PubMed: 21844742]
25. Greenberg AE, Hader SL, Masur H, Young AT, Skillicorn J, Dieffenbach CW. Fighting HIV/AIDS in Washington, D.C. Health Aff (Millwood). 2009; 28(6):1677–87. [PubMed: 19887408]
26. Gallagher KM, Sullivan PS, Lansky A, Onorato IM. Behavioral surveillance among people at risk for HIV infection in the U.S.: the National HIV Behavioral Surveillance System. Public Health Rep. 2007; 122(Suppl 1):32–8. [PubMed: 17354525]

## Table 1

Demographic and behavioral characteristics of NHBS Cycle 1 (2006-7) and Cycle 2 (2010) samples of heterosexuals at elevated risk for HIV from NHBS, Washington, DC.

| | Cycle 1 (2006-7) n=750 Weighted % | Cycle 2 (2010) n=482 Weighted % | $X^2$ | p-value* |
|---|---|---|---|---|
| **Female** | 60.7 | 54.0 | 1.81 | 0.18 |
| **Black** | 93.8 | 89.0 | 1.93 | 0.16 |
| **<30 years old** | 39.2 | 40.6 | 0.09 | 0.76 |
| **Sexual preference: heterosexual** | 89.5 | 80.9 | **7.16** | **0.03** |
| **Less than high school graduate** | 37.6 | 35.8 | 0.38 | 0.54 |
| **Employed (full-time or part-time)** | 29.0 | 30.3 | 0.33 | 0.57 |
| **<$10,000 annual income** | 60.0 | 61.8 | 2.81 | 0.42 |
| **Have current health insurance** | 81.3 | 78.9 | 0.05 | 0.83 |
| **Housing** | | | | |
| Formerly homeless | 7.9 | 21.6 | **28.7** | **<0.0001** |
| Currently homeless | 13.9 | 22.9 | | |
| Never homeless | 78.1 | 55.5 | | |
| **Arrested past 12 mo** | 18.6 | 25.4 | **4.48** | **0.03** |
| **# Sex partners past 12 mo** ** | | | | |
| 1 | 42.1 | 37.1 | **6.74** | **0.03** |
| 2 – 3 | 35.5 | 29.9 | | |
| 4+ | 22.4 | 33.0 | | |
| **Type of partner at last sex past 12 mo** | | | | |
| Main | 72.9 | 62.4 | **6.39** | **0.04** |
| Casual | 20.6 | 30.2 | | |
| Exchange | 6.4 | 7.4 | | |
| **Had vaginal sex past 12 mo** | 98.5 | 90.4 | **16.7** | **<0.0001** |
| If yes: used condom | 28.8 | 25.5 | 0.27 | 0.60 |
| **Had anal sex past 12 mo** | 7.6 | 17.7 | **13.7** | **0.0002** |
| If yes: used condom | 9.2 | 21.6 | 2.91 | 0.09 |

*Chi-square test across HET-1 and HET-2.

**Includes opposite and same sex partners.

## Table 2

HIV prevalence and testing behaviors among NHBS Cycle 1 (2006-7) and Cycle 2 (2010) samples of heterosexuals at elevated risk for HIV, Washington, DC.

| | Cycle 1 (2006-7) n=750 Weighted % | Cycle 2 (2010) n=482 Weighted % | $X^2$ | p-value |
|---|---|---|---|---|
| **HIV Prevalence** | 5.2 | 8.0 | 1.17 | 0.28 |
| If positive, new HIV positive | 47.4 | 20.6 | 1.74 | 0.19 |
| **Ever HIV tested previously** | 87.9 | 84.7 | 0.02 | 0.88 |
| If yes: test within past 24 mo. | 76.0 | 83.0 | **4.81** | **0.03** |
| If yes: test within past 12 mo. | 60.9 | 55.8 | 0.60 | 0.44 |
| **Specimen Type of Last Test** | | | | |
| Swab from mouth | 41.1 | 60.5 | **24.5** | **<0.0001** |
| Blood from arm | 52.3 | 30.9 | | |
| Blood from finger | 6.5 | 8.0 | | |
| **Facility Type at which Last Test Taken** | | | | |
| Community health center / public health clinic | 26.5 | 32.6 | 10.3 | 0.41 |
| HIV/AIDS street outreach / mobile unit | 13.7 | 15.6 | | |
| Correctional facility | 10.7 | 9.1 | | |
| Private doctor's office | 9.9 | 10.9 | | |
| HIV counseling & testing site | 7.4 | 7.5 | | |
| Hospital (inpatient) | 5.4 | 6.0 | | |
| Prenatal/Obstetrics/Family planning clinic | 4.6 | 1.7 | | |
| STD/HIV/AIDS clinic | 3.9 | 2.8 | | |
| Drug treatment program | 3.9 | 2.6 | | |
| Emergency room | 3.1 | 5.1 | | |
| Other* | 10.8 | 6.2 | | |
| **Confidentiality of Test** | | | | |
| Anonymous | 32.5 | 39.2 | 1.56 | 0.21 |
| Confidential | 65.6 | 60.8 | | |
| Don't know | 1.9 | --** | | |
| **Saw health care provider, past 12 mo** | 79.7 | 72.4 | 2.49 | 0.11 |
| If yes, offered an HIV test | 50.6 | 56.3 | 3.03 | 0.08 |

*Other options included: military, at home, and other

**"Don't know" was not an option in 2010.

## Table 3

Weighted multivariable logistic regression model of correlates of testing for HIV in the past 12 months among heterosexuals at elevated risk for HIV from NHBS Cycle 1 (2006-7) and Cycle 2 (2010) samples, Washington, DC.

| | Adjusted* Odds Ratio | 95% Confidence Interval | p-value |
|---|---|---|---|
| **Data collection cycle** | | | |
| Cycle 1 (2006-7) | 1.0 | ref | |
| Cycle 2 (2010) | 0.96 | 0.65, 1.42 | 0.84 |
| **Saw health care provider, past 12 mo** | | | |
| No | 1.0 | ref | |
| Yes | 3.68 | 2.29, 5.89 | <0.0001 |
| **Used condom at last vaginal sex** | | | |
| No | 1.0 | ref | |
| Yes | 1.65 | 1.07, 2.54 | 0.02 |

*Adjusted for variables listed in table.